

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 68454	<b>FOR FURTHER ACTION</b>	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. <b>PCT/AU 95/00461</b>	International filing date ( <i>day/month/year</i> ) 27 July 1995	(Earliest) Priority Date ( <i>day/month/year</i> ) 27 July 1994
Applicant (1) THE COUNCIL OF THE QUEENSLAND INSTITUTE OF MEDICAL RESEARCH (et al) (2) A. SUHRBIER (et al)		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I)
2. ☐ Unity of invention is lacking (See Box II)
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
  - ☐ filed with the international application
  - ☐ furnished by the applicant separately from the international application,
    - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed
  - ☐ transcribed by this Authority
4. With regard to the title,
  - ☒ the text is approved as submitted by the applicant.
  - ☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
  - ☒ the text is approved as submitted by the applicant
  - ☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:

Figure No. 1

  - ☐ as suggested by the applicant.
  - ☒ because the applicant failed to suggest a figure
  - ☐ because this figure better characterises the invention
  - ☐ None of the figures

**A. CLASSIFICATION OF SUBJECT MATTER**Int Cl<sup>6</sup>: A61K 39/00 39/395 C12N 15/86 15/12 15/13 C07K 19/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**Minimum documentation searched (classification system followed by classification symbols)  
A61K 39/-- C12N 15/--

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
DERWENT: WPAT, CASM, KEYWORDS: CYTOTOXIC T CELL\*, CTL, POLYVALEN:, POLYEPITOP:, MULTIEPITOPmMULTIEPITOP:, MULTIPLE EPITOP:, VACC:, IMMUNOGEN:, ANTIGEN:**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Journal of Virology, Volume 67(1), 1993, pages 348-352, Whitton et al. "A string-of-beads vaccine, comprising linked minigenes, confers protection from lethal-dose virus challenge", see abstract, results.	1-13
X	WO 93/25575 (United States of America) 23 December 1993, see page 5 lines 3 to 17, examples, claim 2.	1-13
PX	WO 94/26785 (United States of America) 24 November 1994, see examples, claims.	1-13

☒ Further documents are listed in the continuation of Box C☒ See patent family annex

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search  
29 September 1995

Date of mailing of the international search report

13 OCTOBER 1995

Name and mailing address of the ISA/AU  
AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION  
PO BOX 200  
WODEN ACT 2606  
AUSTRALIA Facsimile No.: (06) 285 3929

Authorized officer

DOUGLAS THWAITES

Telephone No.: (06) 283 2265

C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 94/18234 (United Biomedical Inc.) 18 August 1994, see abstract, claims, figure 1.	1-3, 5-7 4, 8-13
Y	Journal of Immunology, Volume 149(1), 1992, pages 269-276, Rogers et al, "Augmentation of in vivo cytotoxic T lymphocyte activity and reduction of tumor growth by large multivalent immunogen", see abstract.	1-13
Y	WO 93/22343 (The Rockefeller University) 11 November 1993, see pages 1 to 5, claims, figures 7 and 8.	1-13
A	WO 90/11085 (Medical Biology Institute) 4 October 1990, whole document	1-13

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International Application No.

**PCT/AU 95/00461**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member	
WO	9325575	AU	45300/93	EP	644894
WO	9426785	AU	70173/94		
WO	9011085	EP	422164	US	5045320
WO	9418234	AU	61740		

END OF ANNEX

# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum) 68484

<b>Box No. I TITLE OF INVENTION</b>	
POLYEPITOPE VACCINES	
<b>Box No. II APPLICANT</b>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i>	<input type="checkbox"/> This person is also inventor.
THE COUNCIL OF THE QUEENSLAND INSTITUTE OF MEDICAL RESEARCH 300 Herston Road Herston Queensland 4029 Australia	Telephone No.
	Facsimile No.
	Teleprinter No.
State (i.e. country) of nationality: AU	State (i.e. country) of residence: AU
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<b>Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)</b>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i>	This person is:
COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION 407 Royal Parade Parkville Victoria 3052 Australia	<input checked="" type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below.)</i>
State (i.e. country) of nationality: AU	State (i.e. country) of residence: AU
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input checked="" type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
<b>Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE</b>	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)</i>	Telephone No.
F.B. RICE & CO. 28A Montague Street Balmain New South Wales 2041 Australia	(02) 810 7133
	Facsimile No.
	(02) 810 8200
	Teleprinter No.
	AA126727 PATLAW
<input type="checkbox"/> Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

## Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

THE UNIVERSITY OF MELBOURNE  
Royal Parade  
Parkville Victoria 3052  
Australia

This person is:

- ☒ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

THE WALTER AND ELIZA HALL INSTITUTE  
OF MEDICAL RESEARCH  
Royal Melbourne Hospital  
Royal Parade  
Parkville New South Wales 3052  
Australia

This person is:

- ☒ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

BIOTECH AUSTRALIA PTY LIMITED  
28 Barcoo Street  
Roseville New South Wales 2069  
Australia

This person is:

- ☒ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

CSL LIMITED  
45 Poplar Road  
Parkville Victoria 3052  
Australia

This person is:

- ☒ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

☐ all designated States

☒ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on another continuation sheet.

## Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

If none of the following sub-boxes is used, this sheet is not to be included in the request.

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

SUHRBIER, Andreas  
9 Mark Street  
Newmarket Queensland 4051  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

DE

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

THOMSON, Scott Anthony  
11 Burril Crescent  
Ferny Hills Queensland 4055  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

KHANNA, Rajiv  
59 Aberleigh Road  
Herston Queensland 4006  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

IN

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

BURROWS, Scott Renton  
4 Thumon Court  
Bald Hills Queensland 4036  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (i.e. country) of nationality:

AU

State (i.e. country) of residence:

AU

This person is applicant for the purposes of:

- ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on another continuation sheet.

## Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

*If none of the following sub-boxes is used, this sheet is not to be included in the request.*

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

COUPAR, Barbara Elizabeth Howieson  
12 Thear Street  
East Geelong Victoria 3219  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only *(If this check-box is marked, do not fill in below)*

State (i.e. country) of nationality:  
GB

State (i.e. country) of residence:  
AU

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

MOSS, Denis James  
29 Mitchell Street  
Arana Hills Queensland 4054  
Australia

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only *(If this check-box is marked, do not fill in below.)*

State (i.e. country) of nationality:  
AU

State (i.e. country) of residence:  
AU

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only *(If this check-box is marked, do not fill in below.)*

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only *(If this check-box is marked, do not fill in below.)*

State (i.e. country) of nationality:

State (i.e. country) of residence:

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.



## Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

## Regional Patent

- ☒ AP ARIPO Patent: KE Kenya, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, DE Germany, DK Denmark, ES Spain, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

## National Patent (if other kind of protection or treatment desired, specify on dotted line):

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> AM Armenia                               | <input checked="" type="checkbox"/> MD Republic of Moldova      |
| <input checked="" type="checkbox"/> AT Austria                               | <input checked="" type="checkbox"/> MG Madagascar               |
| <input checked="" type="checkbox"/> AU Australia                             | <input checked="" type="checkbox"/> MN Mongolia                 |
| <input checked="" type="checkbox"/> BB Barbados                              | <input checked="" type="checkbox"/> MW Malawi                   |
| <input checked="" type="checkbox"/> BG Bulgaria                              | <input checked="" type="checkbox"/> MX Mexico                   |
| <input checked="" type="checkbox"/> BR Brazil                                | <input checked="" type="checkbox"/> NO Norway                   |
| <input checked="" type="checkbox"/> BY Belarus                               | <input checked="" type="checkbox"/> NZ New Zealand              |
| <input checked="" type="checkbox"/> CA Canada                                | <input checked="" type="checkbox"/> PL Poland                   |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> PT Portugal                 |
| <input checked="" type="checkbox"/> CN China                                 | <input checked="" type="checkbox"/> RO Romania                  |
| <input checked="" type="checkbox"/> CZ Czech Republic                        | <input checked="" type="checkbox"/> RU Russian Federation       |
| <input checked="" type="checkbox"/> DE Germany                               | <input checked="" type="checkbox"/> SD Sudan                    |
| <input checked="" type="checkbox"/> DK Denmark                               | <input checked="" type="checkbox"/> SE Sweden                   |
| <input checked="" type="checkbox"/> EE Estonia                               | <input checked="" type="checkbox"/> SG Singapore                |
| <input checked="" type="checkbox"/> ES Spain                                 | <input checked="" type="checkbox"/> SI Slovenia                 |
| <input checked="" type="checkbox"/> FI Finland                               | <input checked="" type="checkbox"/> SK Slovakia                 |
| <input checked="" type="checkbox"/> GB United Kingdom                        | <input checked="" type="checkbox"/> TJ Tajikistan               |
| <input checked="" type="checkbox"/> GE Georgia                               | <input checked="" type="checkbox"/> TM Turkmenistan             |
| <input checked="" type="checkbox"/> HU Hungary                               | <input checked="" type="checkbox"/> TT Trinidad and Tobago      |
| <input checked="" type="checkbox"/> IS Iceland                               | <input checked="" type="checkbox"/> UA Ukraine                  |
| <input checked="" type="checkbox"/> JP Japan                                 | <input checked="" type="checkbox"/> UG Uganda                   |
| <input checked="" type="checkbox"/> KE Kenya                                 | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> KG Kyrgyzstan                            | <input checked="" type="checkbox"/> UZ Uzbekistan               |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> VN Viet Nam                 |
| <input checked="" type="checkbox"/> KR Republic of Korea                     |   |
| <input checked="" type="checkbox"/> KZ Kazakhstan                            |   |
| <input checked="" type="checkbox"/> LK Sri Lanka                             |   |
| <input checked="" type="checkbox"/> LR Liberia                               |   |
| <input checked="" type="checkbox"/> LT Lithuania                             |   |
| <input checked="" type="checkbox"/> LU Luxembourg                            |   |
| <input checked="" type="checkbox"/> LV Latvia                                |   |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....
- ☐ .....
- ☐ .....

In addition to the designations made above, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except the designation(s) of .....

The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

## Box No. VI PRIORITY CLAIM

Further priority claims are indicated in the Supplemental Box ☐

The priority of the following earlier application(s) is hereby claimed:

Country (in which, or for which, the application was filed)	Filing Date (day/month/year)	Application No.	Office of filing (only for regional or international application)
item (1) Australia	27 July 1994 (27/07/1994)	PM7079	
item (2) Australia	8 February 1995 (08/02/1995)	PN1009	
item (3)			

Mark the following check-box if the certified copy of the earlier application is to be issued by the Office which for the purposes of the present international application is the receiving Office (a fee may be required):

☒ The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) identified above as item(s): (1) and (2)

## Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA /

Earlier search Fill in where a search (international, international-type or other) by the International Searching Authority has already been carried out or requested and the Authority is now requested to base the international search, to the extent possible, on the results of that earlier search. Identify such search or request either by reference to the relevant application (or the translation thereof) or by reference to the search request.

Country (or regional Office): Date (day/month/year): Number:

## Box No. VIII CHECK LIST

This international application contains the following number of sheets:

1. request : 6 sheets  
 2. description : 25 sheets  
 3. claims : 2 sheets  
 4. abstract : 1 sheets  
 5. drawings : 15 sheets

Total : 49 sheets

This international application is accompanied by the item(s) marked below:

1. ☐ separate signed power of attorney  
 2. ☐ copy of general power of attorney  
 3. ☐ statement explaining lack of signature  
 4. ☐ priority document(s) identified in Box No. VI as item(s):  
 5. ☒ fee calculation sheet  
 6. ☐ separate indications concerning deposited microorganisms  
 7. ☐ nucleotide and/or amino acid sequence listing (diskette)  
 8. ☐ other (specify):

Figure No. of the drawings (if any) should accompany the abstract when it is published.

## Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



WILLIAM JOHN PICKERING

For and on behalf of F.B. RICE &amp; CO.

For receiving Office use only

1. Date of actual receipt of the purported international application:	2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received.
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):	
5. International Searching Authority specified by the applicant: ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

## PCT

## FEE CALCULATION SHEET

## Annex to the Request

For receiving Office use only

International application No.

Applicant's or agent's  
file reference

68484

Date stamp of the receiving Office

Applicant

THE COUNCIL OF THE QUEENSLAND INSTITUTE  
OF MEDICAL RESEARCH et al.

## CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE . . . . . 100.00 T

2. SEARCH FEE . . . . . 800.00 S

International search to be carried out by

(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)

## 3. INTERNATIONAL FEE

## Basic Fee

The international application contains 49 sheets.first 30 sheets . . . . . 906.00 b<sub>1</sub>19 x 18.00 = 342.00 b<sub>2</sub>  
remaining sheets additional amountAdd amounts entered at b<sub>1</sub> and b<sub>2</sub>

and enter total at B . . . . . 1,248.00 B

## Designation Fee

. . . . . x . . . . . = 2,200.00 D  
number of designations amount of designation fee

(If that total exceeds the figure which corresponds to the amount of the designation fee multiplied by ten, enter the latter figure in box D.)

Add amounts entered at B and D and enter total at I . . . . . 3,448.00 I

4. FEE FOR PRIORITY DOCUMENT . . . . . 190.00 P

## 5. TOTAL FEES PAYABLE

Add amounts entered at T, S, I and P,  
and enter total in the TOTAL box . . . . .

4,538.00

TOTAL

☐ The designation fee is not paid at this time.

## MODE OF PAYMENT

☐ authorization to charge  
deposit account (see below)☐ bank draft☐ coupons☒ cheque☐ cash☐ other (specify):☐ postal money order☐ revenue stamps

## DEPOSIT ACCOUNT AUTHORIZATION (this mode of payment may not be available at all receiving Offices)

The RO/ ☐ is hereby authorized to charge the total fees indicated above to my deposit account.☐ is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.☐ is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

Deposit Account Number

Date (day/month/year)

Signature

**INTERNATIONAL COOPERATION TREATY**  
**PCT**  
**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 68454	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International application No. <b>PCT/AU 95/00461</b>	International filing date 27 July 1995	Priority Date 27 July 1994
International Patent Classification (IPC) or national classification and IPC  <b>Int. Cl.<sup>6</sup> A61K 39/00 39/395 C12N 15/86 15/12 15/13 C07K 19/00</b>		
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1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of <b>3</b> sheets, including this cover sheet.  <input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  These annexes consist of a total of      sheet(s).
3.	This report contains indications relating to the following items:  I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 23 January 1996	Date of completion of the report 22 May 1996
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**I. Basis of the report**

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

☒ the international application as originally filed.

☐ the description,        pages , as originally filed,  
                                 pages , filed with the demand,  
                                 pages , filed with the letter of ,  
                                 pages , filed with the letter of .

☐ the claims,        Nos. , as originally filed,  
                                 Nos. , as amended under Article 19,  
                                 Nos. , filed with the demand,  
                                 Nos. , filed with the letter of ,  
                                 Nos. , filed with the letter of .

☐ the drawings,        sheets/fig , as originally filed,  
                                 sheets/fig , filed with the demand,  
                                 sheets/fig , filed with the letter of ,  
                                 sheets/fig , filed with the letter of .

2. The amendments have resulted in the cancellation of:

☐ the description,        pages

☐ the claims,        Nos.

☐ the drawings,        sheets/fig

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims	YES
	Claims 1-13	NO
Inventive step (IS)	Claims	YES
	Claims 1-13	NO
Industrial applicability (IA)	Claims 1-13	YES
	Claims	NO

**2. Citations and explanations**

The present invention is directed towards a recombinant polypeptide cytotoxic T lymphocyte vaccine. The invention specifically requires that at least one recombinant protein is substantially free of sequences naturally found to flank the cytotoxic T lymphocyte epitopes. This does not exclude all flanking regions as the phrase "substantially free" does include small lengths of amino acids (1 to 5) between the epitope regions. This is clearly indicated on page 2 at lines 3 to 9 and again at lines 17 to 22.

It would appear, particularly in light of figure 4, that the epitopes of the vaccine are jointed end to end with no "spacer regions" separating the epitopes. However, this is not the case as the claims do not specifically exclude "spacer regions". Rather, if such spacers are present, then they must not be comprised of the epitope's natural flanking regions. If the claims are construed in this way then the invention is clearly not novel. Multiepitope vaccines have been constructed previously as Whitton et al, WO 93/25575, WO 94/26785 and WO 94/18234 clearly indicate. While spacer regions are present in the vaccines of these citations, these regions are not sequences found to naturally flank the epitopes. Thus claims 1 to 13 are not novel.

If the invention actually excludes spacer regions and the claims are amended to do so, then the invention lacks an inventive step. This is due to the phrase "substantially free" which includes flanking regions of 1 to 5 amino acids. These 1 to 5 amino acid regions are sequences naturally found to flank the cytotoxic T lymphocyte epitopes. These regions are taken to be synonymous with the spacer regions of the prior art and appear to serve the same function. It appears the only function of these 1 to 5 amino acid "spacer regions" of the present invention, is to separate the epitope regions. Thus the function of these spacer regions would not be affected by their original source. The substitution of the spacer regions of the prior art with regions naturally found flanking the epitope does not involve an inventive step. In light of this claims 1 to 13 lack an inventive step.